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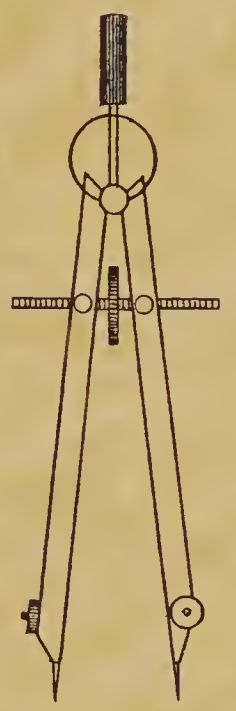
CARTOGRAPHIC CHECK-LIST

An Aid to Achieving Quality and Completeness in the Creation of Mapping Products

Stephen Meszaros



U.S. Department of the Interior
Bureau of Land Management
Arizona State Office

Phoenix, Arizona

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ABSTRACT

A check-list is provided to be used with maps in order to assist in determining whether they are ready for publication, presentation, or display.

NOTE

This document has been designed to be disassembled for reproduction purposes. This has been done so that multiple copies may be made available to "check-off" as many maps as the reader is producing. The pages are printed on only one side; simply take out the staples that bind the document and place the pages in your copy machine. Run as many copies as you require for your mapping projects.

TABLE OF CONTENTS

Page

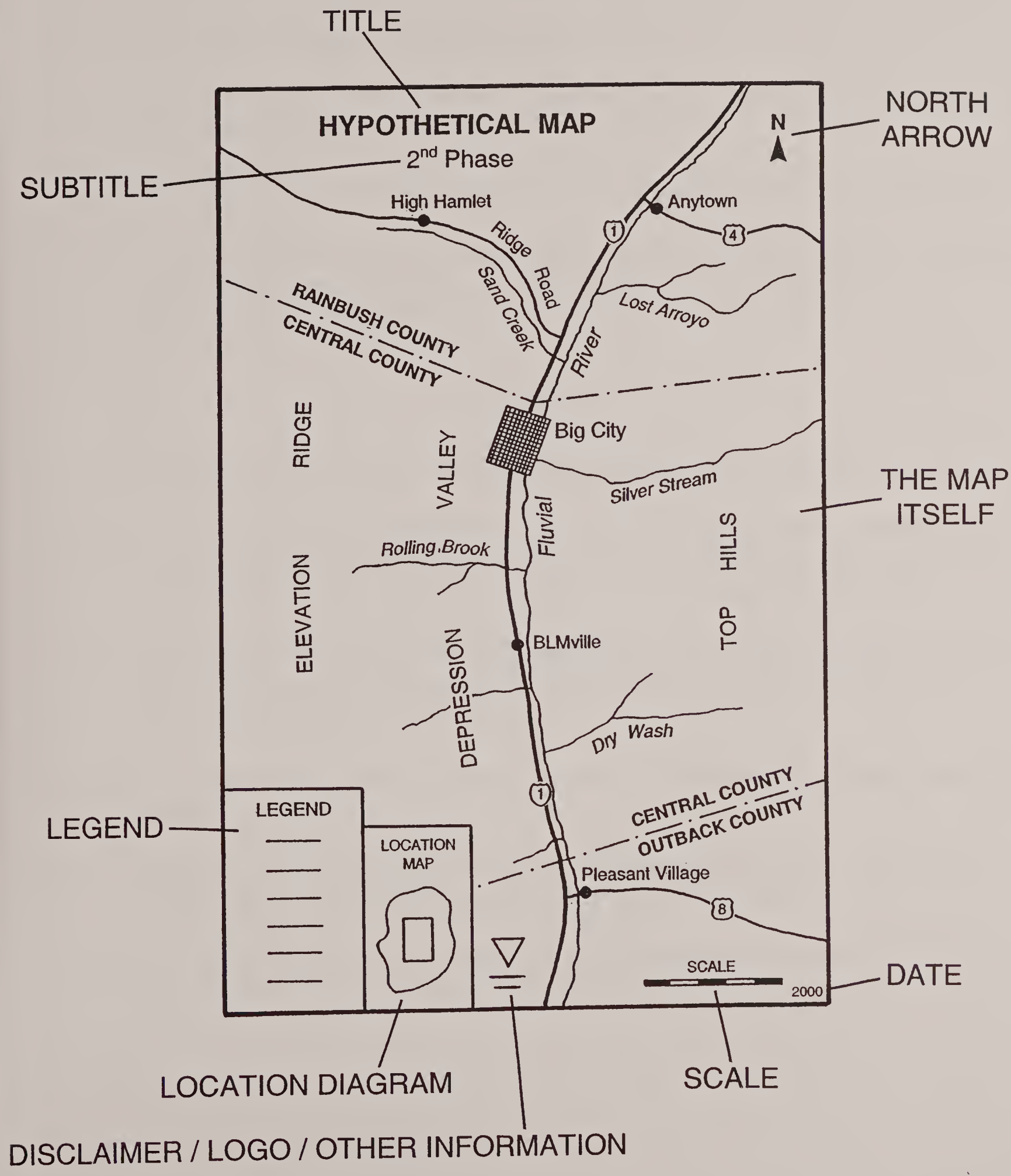
Abstract ii
Note iii
Introduction 1
Major Elements of a Map 2
Title 3
Legend 3
Scale 4
Location Diagram 5
North Arrow 5
Date 5
Coordinates 6
Organization Logo 6
Organization Information 6
Disclaimer 6
The Map Itself 7
Map Text 7
Map Relief 8
Editing the Final Map 8
Appendix 9
Type Sizes 10
Bibliography 11
About the Author 12

INTRODUCTION

The purpose of this *Cartographic Check-List* is to enable the novice cartographer to analyze his or her map, in order to prevent possible errors or omissions. It accomplishes this by allowing the "checking-off" of numerous cartographic items, in a systematic fashion. This will also aid the cartographer in thinking over the "big picture" aspects of the map, such as its overall purpose and whether this purpose is achieved.

Obviously since maps are different, it would be impossible to include all the possible factors influencing each and every particular map. However, most maps have numerous items in common and these are the ones that will be listed (and commented upon) here. The major topic of cartographic design is covered in another publication by the author entitled *Cartographic Notebook. Map Editing Guide* by the author is also available. See the bibliography for information on both of these documents.

MAJOR ELEMENTS OF A MAP



TITLE

_____ Is there a title on the map? *All maps need titles.*

_____ Is the title the largest / boldest text on the map? *It should be <u>at least</u> 25% larger than any other text on the page.*

_____ Does the title accurately and succinctly express the meaning or subject matter of the map?

_____ Does the map need a subtitle to further explain or define the subject of the map? *It should be in smaller text than the main title – but still prominent – and is usually located immediately below the main title.*

LEGEND*

_____ Does the map need a legend? *Most maps do, as a legend is largely what explains the map.*

_____ Does the legend include <u>all</u> the symbols, line styles, tones and / or colors, and other items featured on the map? *Every symbol, line style, etc. that is shown on the map <u>must</u> be included and explained in the legend, so that the reader can understand the map.*

_____ The symbols shown on the map should be the <u>same size</u> and <u>boldness</u> as those shown in the legend. *This will avoid confusion by the reader that may result if the map and legend symbols are of a different size or boldness.*

_____ The line styles and thickness must be exactly the same on <u>both</u> map and legend. *This avoids confusion.*

_____ Tones and / or colors also need to be the same, between map and legend. *Color can be especially tricky as it may change when overprinted on a relief base.*

_____ Are the text and symbols evenly aligned and properly spaced in the legend?

* See page 63 of the *Cartographic Notebook.*

SCALE*

_____ Has a scale been included on the map? *All maps must have scales so that the reader is able to understand the distance relationships shown on the map. Only in very special graphic displays, for unusual purposes, is a scale sometimes omitted – and this is a rare exception.*

_____ Is the scale a bar or rake scale? *The bar and rake scales are the most visually easy to understand by the general map user. In addition, they have the major advantage of maintaining correct length if the map is enlarged or reduced (since they enlarge or reduce with the map).*

_____ The proportion scale (ie, 1:63,360; 1:250,000, etc.) is not recommended for use without also including a bar scale. *This is because the general public won't understand the proportional scale (even though it is near and dear to a professional cartographer's heart). Also, if the map size is changed – even slightly – the proportional scale becomes incorrect.*

_____ The unit comparison scale (ie, 1 inch equals 1 mile, etc.) is not recommended for use. *It has several drawbacks, not the least of which is that a change in map size makes it immediately incorrect.*

_____ Are the scale divisions even numbers on the bar scale (as, for example, 2, 4, 6, etc. miles)? *Even numbers make it easier to interpolate the half distance measurements between them. In this example, 3 miles and 5 miles would be easy to determine, even though they weren't marked on the scale (they are exactly between 2 and 4, and 4 and 6 miles respectively). If 3, 6, and 9 divisions had been used instead, the intermediates would be 4.5 and 7.5, which are much harder to visualize.*

_____ If a proportion scale is included on the map, use a "rounded off number." *Computer cartography programs today enable the map maker to construct a map at an exact scale, for example 1:251,836. This number however makes little sense, even to a professional cartographer. Round it (and the associated map) to 1:250,000 – which has much more meaning to the knowledgeable reader.*

_____ Select a proper length scale bar for the map. *A bar that is too short doesn't give enough information. One that is too long takes up too much space and may consequently be considered "overkill."*

_____ If possible, use both English and metric bar scales (one above the other with the "0" point vertically in common). *This accommodates all map users, regardless of which measurement system they are comfortable with.*

* See page 64 of the *Cartographic Notebook*.

LOCATION DIAGRAM

_____ Does the map need a location diagram? *Many maps, particularly those of larger scale (showing a small geographical area), need a location diagram. This indicates the map area within a larger region that is more familiar to the map reader.*

_____ Keep the location diagram simple. *Only a few physical and / or cultural features are required in order to show the location of the main map.*

_____ Be sure to select a large enough area for the location diagram. *It should be a region that is familiar to the targeted audience of the map.*

NORTH ARROW

_____ Does the map need a north arrow? *Mapping convention usually assumes that north is at the top of the map, so the north arrow is not absolutely necessary if this is the case. However, if north is <u>not</u> at the top of the map, then a north arrow is <u>mandatory</u>. Including a north arrow, in any case, does avoid confusion in the true orientation of the map.*

_____ Is the north arrow (if included) located in a logical place on the map, and of a prominent size? *The reader needs to be cognizant of the existence of the north arrow, but not overwhelmed by it.*

_____ Is the north arrow of a clear and clean enough design so that there is no mistaking that it is indeed <u>a north arrow</u>? *Simple designs are probably best. "Fancy" north arrows may be OK just as long as they are not so ornate that they detract from the rest of the map, or that the reader has trouble figuring out exactly what they are!*

DATE

_____ Does the map have a date? *If it is a stand-alone map (exists as one sheet without any additional material) the map should have a date so the reader knows how current the information upon it is. If it is in a dated document this may not be absolutely necessary – as long as the map was produced at about the same time as the document. Also, if the map has been updated this should be indicated.*

COORDINATES

_____ Does the map need a coordinate system? *Many maps require a coordinate system, such as latitude & longitude or township & range, to assist in locating features on the map.*

_____ Has the correct coordinate system been selected for the map? *It should be based upon the purpose or use of the map.*

ORGANIZATION LOGO

_____ Would the map benefit from the inclusion of an organization logo? *Organization information (see the next section) may be used instead, or both may be used as long as there is adequate space available on the map.*

_____ Logo size should be appropriate. *The logo should not be too small (so it is hard to read) or too large (so it overwhelms the rest of the information on the map). This is a judgment call.*

_____ Are multiple logos, representing different agencies, required? *If this is the case, care must be taken in the proper placement of the logos – both for design and also for political hierarchy reasons.*

ORGANIZATION INFORMATION

_____ Does the map require organization information? *Typically this is information that identifies the agency or entity that is responsible for the creation of the map. If the map is in a document that already contains this material, it may not be necessary. On the other hand, if it is a "stand alone map" this information may be required.*

_____ A logo (see the previous section) may substitute for the organization information in some cases, if map space is tight. *Both may also be used if this is desirable and space is available.*

DISCLAIMER

_____ Does the map require a disclaimer? *If it needs one, it should be included. However, steps should be taken in map construction and content to keep disclaimers to a minimum.*

THE MAP ITSELF

_____ In general, does the map conform to "The Golden Rule of Cartography?"* The Golden Rule states that "A Map must be Readable, Understandable, and Accurate." *"Readable" means that the text, lines, and other elements of the map are easily visible. "Understandable" indicates that the map has been designed at the appropriate level so that its audience will be able to comprehend it. "Accurate" signifies that the map is correct and up-to-date.*

MAP TEXT

_____ Is the map text of an easily readable style? *Ornate hard-to-read styles should be avoided.*

_____ Is the map text of a large enough size to be easily visible? *The smallest text on the map should be no smaller than 6 point type, and preferably 8 point or larger. (See the Appendix.)*

_____ Does the text follow an appropriate hierarchy of sizes depending upon the purpose of the map? *In other words, the features that define the subject of the map should be given larger and / or bolder text than the other merely supporting or informative features.*

_____ Is there a <u>smooth range</u> of text sizes on the map? *Generally the sizes should gradually flow from the largest text (the title) to the smallest. Avoid large, odd looking text gaps between the largest and smallest text.*

_____ Does any of the text fall <u>on top</u> of other text, symbols, or anything else on the map that makes it hard to read? *This can easily happen in computer cartography layering. The map should be edited for this and corrected.*

_____ Do the text labels flow <u>smoothly</u> with rivers and other curving geographical features? *It should follow the "contours" of these features in order to be understandable and visually appealing.*

_____ Use italic text for hydrologic (water) features. *This is a standard cartographic convention.*

* See page 3 of the *Cartographic Notebook*.

MAP RELIEF*

_____ Is map relief <u>required</u> on the map, or would it be beneficial to include it? *If the physical terrain is important to the purpose or understanding of the subject matter of the map, it should be included.*

_____ Are contour lines required? *If "exact" elevation measurements need to be obtained from the map, contour lines should be used.*

_____ Is shaded relief required? *If a very "visual" view of the terrain is desired, the shaded relief technique may be used.*

_____ Would a <u>combination</u> of contour lines and shaded relief be useful? *By combining both contours and shaded relief a map that has both elevation measurement capability and visual appeal may be created. This can work as long as the contour interval is not too dense (so it becomes unreadable) and the shading on the relief is not too dark (so the contours can't be seen beneath it).*

_____ Would shaded relief and spot elevations be appropriate for the map? *A shaded relief map with spot elevations (such as mountain peak heights or city altitudes) can make for a very visual map that still contains numerical data for the use of the reader.*

EDITING THE FINAL MAP**

_____ Has the final map been edited for possible errors or inconsistencies? *All maps that are to be distributed to the general public as publications, presentations, or exhibits and displays should be reviewed by a professional editor in the cartographic or visual information field.*

* See page 136 of the *Cartographic Notebook*.
** See the *Map Editing Guide*.

APPENDIX

TYPE SIZES

4 POINT TYPE Point Type

5 POINT TYPE Point Type

6 POINT TYPE Point Type – *smallest acceptable mapping size type*

7 POINT TYPE Point Type

8 POINT TYPE Point Type – *ideal smallest mapping size type*

9 POINT TYPE Point Type

10 POINT TYPE Point Type

11 POINT TYPE Point Type

12 POINT TYPE Point Type

14 POINT TYPE Point Type – *smallest acceptable slide / vugraph size type*

16 POINT TYPE Point Type

18 POINT TYPE Point Type – *ideal smallest slide / vugraph size type*

20 POINT TYPE Point Type

24 POINT TYPE Point Type – *smallest acceptable display / exhibit size type*

30 POINT TYPE Point Type

36 POINT TYPE Point Type

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Cartographic Notebook: A Brief Guide to some aspects of Cartographic Design by Stephen Meszaros. U.S. Department of the Interior, Bureau of Land Management, Arizona State Office, Phoenix, Arizona: 2001.

Map Editing Guide: A Brief Guide to the Review and Editing of Maps and Graphics by Stephen Meszaros. U.S. Department of the Interior, Bureau of Land Management, Arizona State Office, Phoenix Arizona: 2002.

Other Cartographic Textbooks and Popular Books
(select the most recent edition available)

Elements of Cartography by Arthur H. Robinson, et al.

Cartography: Thematic Map Design by Borden D. Dent

Cartographic Design and Production by J. S. Keates

Introductory Cartography by John Campbell

Cartography: Visualization of Spatial Data by M. J. Kraak and F. J. Ormeling

Maps and Diagrams by F.J. Monkhouse and H.R. Wilkinson

Mapping by David Greenhood

ABOUT THE AUTHOR

Stephen Meszaros has been involved in the cartographic and graphic field for over 45 years. (He began actively drawing maps in grade school, on everything from note paper, to flattened paper bags, to old window shades!) Steve graduated from Delaware Literary Institute & Franklin Central School, in upstate New York, with School and Regents Diplomas in Science & Mathematics. He also received the school Geography Prize. At Syracuse University he took his Bachelor's Degree in Geography, specializing in cartography and physical geography. This was followed by 4 years in the U.S. Air Force as a Drafting and Cartographic Supervisor for the Aerospace Cartographic and Geodetic Service, based in Kansas. During this time he spent a year in Brazil and 6 months in Vietnam. Following military service Steve completed a Master's Degree in Geography at Arizona State University, concentrating on regional geography and historical & contemporary geographic thought.

Steve's civil service career began with the U.S. Geological Survey at the Center of Astrogeology in Arizona, the Water Resources Division in California, and the Special Mapping Center at USGS Headquarters in Virginia. In these positions he was a scientific illustrator, cartographer, and map editor. This was followed by 10 years with NASA as a visual information specialist for the Goddard Space Flight Center in Maryland and the Ames Research Center / Dryden Flight Research Facility in California. During this period of time Steve took a 6 month break in government service to become the Chief of the Public Affairs Office at Kitt Peak National Observatory in Arizona. For the past 15 years he has been a visual information specialist for the Arizona State Office of the Bureau of Land Management.

Steve's maps and visuals are used across the United States. His displays and exhibits have been shown in the U.S. and Europe, and his slide sets are featured world-wide. Most major astronomy textbooks contain his illustrations, as do many popular-level space science books and journals. His work has appeared on television and the World Wide Web (and one of his visuals has even been made into a jigsaw puzzle!)

Steve has been the recipient of many honors throughout his career, including the prestigious NASA Outstanding Service Award. He is the author of over 20 publications for NASA and the astronomical and educational community. Following retirement from the government with over 30 years of service, Steve plans to continue his work as a consultant to NASA and various universities.

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